CLAIMS:

1. A medical instrument comprising:

a guide wire that is inserted at one end through a vascular portion narrowed by deposits and extended at the other end out of a patient's body;

a rotating cutter that is rotatably and slidably guided over said guide wire and is driven to cut away the deposits in said narrowed vascular portion;

a hollow drive shaft that is operatively connected to said rotating cutter and through which said guide wire is inserted;

a fixed sheath having inserted therein said drive shaft; and

a controller having a drive assembly for rotating said drive shaft;

wherein said rotating cutter is driven to perform intravascular treatment to establish patency of said vascular portion or to distend said vascular portion;

characterized in that:

in the case of further distending said narrowed vascular portion after cutting treatment, said rotating cutter can be pulled out of the patient's body along said guide wire, together with said drive shaft and said fixed sheath; and

said rotating cutter has a deformable member that expands radially on said guide wire after being pulled out of the patient's body.

2. The medical instrument of claim 1, characterized in that the deformable member of said rotating cutter is formed by a plurality of cutting blades arranged side by side on the rotating cutter circumferentially thereof.

3. The medical instrument of claim 2, characterized in that said cutting blades are capable of plastic deformation in a radial direction of said rotating cutter to enlarge its diameter.

4. The medical instrument of claim 2, characterized in that said cutting blades are deformable by a toggle mechanism radially of said rotating cuter to enlarge its diameter.

5. The medical instrument of claim 2, characterized in that said cutting blades are deformed by a wedge radially of said rotating cutter to enlarge its diameter.

6. The medical instrument of claim 1 or 2, characterized in that said rotating cutter is provided with a thermal contraction or expansion member for deforming the deformable member radially of the rotating cutter to enlarge its diameter.

7. The medical instrument of claim 1 or 2, characterized in that the deformable member of said rotating cutter are formed of a shape-memory alloy or similar thermally deformable material.

8. The medical instrument of claim 1, characterized in that:

a jig is provided for deforming the deformable member of said rotating cutter radially thereof; and

said jig is disposed coaxially with or in proximity to said drive shaft.

9. The medical instrument of claim 1, characterized in that:

said controller is provided with a mechanism for pushing out said rotating cutter from a distal end of said fixed sheath toward the treatment site forwardly thereof and a mechanism for pulling back said rotating cutter; and

these mechanisms are actuated by a squeeze-type operating lever provided with an auto-retract mechanism and a position-retaining mechanism.

10. The medical instrument of claim 1, characterized in that:

a jig is provided for deforming the deformable member of said rotating cutter radially thereof; and

said jig is formed by a one-hand operated, squeeze-type lever mechanism which utilizes a force-multiplying mechanism by a lever or cam.

11. The medical instrument of claim 1 or 9, characterized in that said controller is provided with a vibrating mechanism for reciprocating said rotating cutter along the guide wire.

12. The medical instrument of claim 1 or 10, characterized in that said controller has built therein a drive assembly for transmitting turning force to said drive shaft; and

said drive assembly has a motor whose rotary shaft is hollow for the insertion therethrough of said drive shaft.

13. The medical instrument of claim 11 or 12, characterized in that:

said controller has a drive shaft chucking mechanism and a soft-sheath attaching/detaching mechanism.